[White and Blue]

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THE WHITE AND BLUE.

CHARACTER IS POWER.

V. II PROVO CITY, UTAH, OCTOBER 15, 1900. No I

LITERARY.

Curiosities of the Academy.

As the enrollment of the Academy grows steadily greater, as its power for good is made more and more manifest, so also is its collection of curiosities multiplying and increasing year by year. By reading the circular for 1900-1901 it will be found that we had a strange lot of students here last year,—strange in nature, occupation, and color.

We had Bean (s) and Berry (s) but as there is no record of anyone ever having tasted them, we cannot vouch for their goodness. They are not here this year, but we have other representatives from the vegetable kingdom who will receive special mention as we discover their value.

We had quite an extensive menagerie, too. We had three Birds beside the Robin, (their technical names may be found on page 80 of the B. Y. A. circular;) a Lamb, a Crane and a Partridge. They were all gentle, lovable animals, in fact, the Partridge was a great favorite, not only among the students but also among some members of the Faculty.

Our environments were also very pleasant last year. Day and Knight came almost as regularly to us as to any other people. We had a nice little Berg, and altho we had only one Busch we were careful to have a Gardner in hopes that more would come. We had Woods and Hills and any psychologist will tell you what important factors they are in the education of our western people. Our Greenwood, tho somewhat reserved, was appreciated by those who knew of the warmth and wealth that lay behind the apparent coldness and indifference.

Yes, we had wealth, too. We sent one Nicol on a mission and still we had Nicholes left, and nickles always come before the dollar. There were those among us who could make dollars—Millers, Miners, Mowers, Potters, Shepherds, Taylors (tailors) and Hunters. It seems strange that these people do not follow their trades instead of studying to become school teachers, but I suppose it is human nature to do a little different from what people expect you to do.

During the winter we had several Snows, but they were good and seasonable. The Horne that we had was not one of the formidable kind, and even our Payne was pleasant, when certain young ladies were present. We had one Page at school which finally developed into a book, and it is said this book may now be found in a sheep-camp in southern Utah. Perhaps we may have educated sheep after while.

But strangest of all is the fact that we not only had White people in our school, but also Black and Brown, and for a limited time we even had Coons among us.

With these facts among us it is safe to predict that the B. Y. A. will one day stand first among all museums and curiosity shops, and that the Exploring Expedition will find no greater curiosities than those found within our school walls.

NELLIE SCHOFIELD.

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Chivalry.

There is good ground for believing that rudiments of chivalry are to be detected in early Teutonic customs, and it may have made some advance among the Gauls. But

as to the origin of knighthood or chivalry as it existed in the Middle Ages—implying as it did a formal assumption and initiation into the profession of arms—nothing beyond probable conjecture is possible.

We are told by Tacitus that the German tribes of his day celebrated the initiation of their young men into the ranks of warriors with much circumstance and ceremony. All the people of the district to which the candidate belonged were called together, his qualification for the honor about to be conferred was considered and if he was deemed worthy his chief, his father or a near kinsman presented him with a shield and a lance.

Another custom apparently common to the Goths and the Franks was the ceremony of "Adoption by Arms." Seldon and Du Cange concur in tracing the ceremony of "Dubbing to Knighthood" directly back to the ceremony of "Adoption by Arms." Among the Lombards sons of kings were not allowed to sit at the table of their fathers until they had been invested with arms, and that too by a foreign prince or potentate. But among the Franks, according to Du Cange, we find Charlemagne girding his sons Louis the Pious and Charles the Bald, with the sword when they had arrived at manhood.

History is silent as to how chivalry was introduced into England, but as Dr. Stubbs has said, "It is but reasonable to think that kings so well acquainted with foreign usages as Ethelred, Canute and Edward the Conqueror could hardly have failed to introduce into England the institution of chivalry then springing up in every country of Europe."

From a very early period in all countries there seems to have prevailed two modes of conferring knighthood. As soon as we have any historical evidence of their separate and distinct existence we find them as severally appropriated, the first to time of war and the second to time of peace. Between the Eleventh and Sixteenth Centuries knights were made before and after every battle. The one to be knighted was made to kneel before the officiating officer who drew a sword and laid it on either of the candidate's shoulders and said: "In the name of God, St. Michael and St. George I dub thee knight."

Very different were the solemnities which attended the creation of a knight when the complete procedure was observed. Of these "ceremonies and circumstances" Seldon gives several examples, especially those of the knighting of Geoffrey of Anjou by Henry I, of Alexander III of Scotland by Henry III of England, and Edward II by his father Edward I.

The process of inauguration was commenced in the evening by placing the candidate under the care of "esquires of honor, grave and well seen in courtship and also in feats of chivalry," who were to be "governors in all things relating to him." First they conducted him to the barber who shaved him and cut his hair. Then he was placed in a bath and while there two "ancient and graver knights" attended him "to inform, instruct and counsel him touching the order of feats of chivalry." When this was done they poured some water over his shoulders, signing the left shoulder with the cross. He was then put in a plain bed where he remained until dry, when the two esquires dressed him in a white shirt and a "robe of russet with long sleeves having a hood like a hermit's." The two "ancient and grave knights" led him to the chapel where he spent the night in prayer. At daybreak he confessed to the priest and communed in the mass, then went to his chamber and remained until aroused by the knights, who conducted him to the hall where he was to be knighted. Everything being ready the prince or subject who was to officiate entered, carrying the candidate's sword and spurs—giving the right spur to a "noble and gentle knight" present, he directed him to fasten it upon the right heel of the candidate which he did, signing the candidate's knee with the cross. In like manner the left spur was fastened on. The prince, or he who was creating the knight, took the sword, girded the applicant with it, embraced him and then smote him on the neck saying: "Be thou a good knight," concluding with a kiss.

But the full solemnities for conferring knighthood seem to have been largely superseded by the practice of dubbing or giving the accolade alone. In England it became at last restricted to such knights as were made at occasions of state. To them the particular name "knights of the bath" was assigned, while knights made in the ordinary way were called "knights of the sword." But all knights were also "knights of the spur," because their spurs were golden or gilt, and these in connection with the sword became the leading characteristic ensign of knighthood. And as Mr. Ashmole has said: "If we sum up the principal ensigns of knighthood, ancient and modern, we shall find they have been or are a horse, gold reins, shield and lance, a belt and sword, gilt spurs and a gold chain or collar."

In England there have existed seven orders of knighthood. The oldest and most illustrious is undoubtedly the "Order of the Garter," which was instituted in the middle of the Fourteenth Century, when, to use Hallam's words, the court of England "was the sun, as it were of that system which embraced the valor and nobility of the Christian world," when "chivalry was in its zenith, and in all the virtues which adorned the knightly character none were so conspicuous as Edward III and the Black Prince."

The age of chivalry can properly be said to extend from the beginning of the crusades to the ending of the War of the Roses. Within the limits of that period, comprising about four hundred years, all that was peculiarly characteristic of it arose, attained it maturity, and fell into decay. It is true that some of its spirit and many of its external forms lingered on throughout the greater part of the Sixteenth Century, but, as a military system, chivalry was at an end. The revolution in the mode of warfare which had commenced under the reign of Edward III was completed under Henry VIII. Knights still disported themselves in the lists as bravely and gallantly as of old, but neither their arms or their armor availed them aught against the armor and musket they were forced to encounter in the field.

But chivalry still lived in its standard of conduct and code of honor as, indeed, it still exists, to some extent, the test of propriety and the guide of manners in the higher ranks of society all over Europe.

Poets have sung in verse the virtues of chivalry, and fiction has described it as "the unbought grace of life, the cheap defense of nature, the nurse of manly sentiments and heroic enterprise." "Never, never more," says Burk, "shall we behold that generous loyalty to rank and sex, that proud submission, that dignified obedience, that subordination of the heart which kept alive, even in servitude itself, the spirit of an exalted freedom, and created that sensibility of principle, that chastity of honor which felt a stain like a wound, which ennobled whatever it touched, and under which, vice itself lost half its evil by losing all its grossness." This may be somewhat overdrawn or exaggerated, but there can be no doubt that chivalry was a civilizing institution and partially redeemed the Middle Ages. It gave use to beautiful sentiments and it blazed in new virtues. The knights learned gradually to treat each other with peculiar courtesy. They became generous in battle as in misfortune, for they all alike belonged to the noble class and felt a common bond in the pride of birth. Among themselves there was no higher distinction than that of a true gentleman. The poorest knight was welcome at any castle or at any festival, at the tournament or in the chase. They were expected to excel in courage, in truthfulness, in courtesy, in generosity, and in loyalty. If they condemned anything it was selfishness, treachery, and hypocrisy. They were not ashamed to be thought religious, and never once did the mailed warrior neglect to say mass. It was this religious influence that transformed the rude baron into a courteous gentleman.

The distinguishing glory of chivalry was its devotion to women. Love of God and the ladies—"I blush," says Gibbon, "to connect such discordant terms"—was enjoined as a single duty. For the first time in history woman became the equal partner of her husband. Chivaly elevated her

upon a pedestal and she became an object of worship, an object of idolatry.

A knight without a lady-love was as "a ship without a rudder, a horse without a bridle, a sword without a hilt, a sky without a star."

Divest chivalry of its religious element, take away its glory and its fascination and the knight would be only a hard-hearted warrior, opposing the poor and miserable. But Christianity refined and made him human, while it dignified the partner of his toils, and gave birth to virtues which commanded reverence. The soul of chivalry, closely examined in its influence over men and women, after all, was that power which is, and will be throughout all the ages, the hope and glory of our world.

WALTER E. CLUFF.

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College Song.

[This is the song that the B. Y. A. students love to hear. To them it is as inspiring as our national air, representing, as it does, heart-throbs written into sentences.]

All hail the College that we love!
Our home, the home of wisdom's sway.
Oh, let us lift our voice above—
This thronging multitude to-day.
No pride of riches here may sue:
The head, the heart, the hand,
United must be true,—
Be true to thee, our WHITE AND BLUE.
Then, come, join our loyal band.

CHOUS:

Then, make a way for the B. Y. A.!
We've come to work, and mean to stay.
We'll raise the standard, win the day,
Hip, hip, hurrah, for the B. Y. A.!

There is no emblem half so sweet,
As our colors, colors pure and true;
There is no banner that we greet,
Like thee, our dear old WHITE AND BLUE.
No youth its beauty e'er denies;
For blue is heaven's own hue,
The glory of the skies,
And white, the robes of paradise,
Then, long live our WHITE AND BLUE!

PEDAGOGICAL.

Philosophy of the New Arithmetic.

Fellow pedagogs, do you earnestly intend to assume the responsibility of assisting to dethrone the time-sustained principles that have held child-mind in thraldom? That is your mission. It is not enough that you lead pupils over a prescribed course in a given time, receive your salary and feel that all is accomplished. Your individuality is needed to devise new and natural methods, to test those in use, and determine their virtue as a psychological means to a practical end.

Perhaps no branch of the common school curriculum has had its basic principles so completely shattered of late as that of arithmetic. At the beginning of this century figures were the end and aim of mathematics. Later it was conceived that figures were only symbols, not realities. As arithmetic is a reality, educators next decided number was the foundation of all arithmetical work. Tho this was an improvement on the old system, it still placed arithmetic as a mental science, while in reality it deals with tangible things. For do we not know mathematics as we know other physical sciences—by means of comparison? Can there be thought without observing phenomena? phenomena without nomena? Then to build up a science we must observe things in their relationship.

All knowledge is relative. How can a complete thought be formed when one of the related terms is not present in consciousness? The only way we think number is by classifying ideas of relative magnitude. Any concept of magnitude is a deduction from concrete things as greater, less than, or equal to certain others. Much time has been wasted in trying to force the mind to begin with abstract notions of number. The impressions derived from comparison of objects as bulk, mass, length, etc., are the only possible means of obtaining mathe-

matical intelligence. To concede the foregoing principles, we must protest against the prevailing methods of teachers and text-books.

Intrepid reasoners now declare that we do not think number but magnitude; relations, not abstractions. Upon these psychological bases Mr. Speer has prepared primary and elementary text-books. So far as they have been used by conscientious and intelligent teachers marvelous results have been attained. These works are rapidly becoming known, and their great superiority acknowledged by progressive educators. But parents and many teachers still condemn them as almost lacking a semblance of what they had formerly thought arithmetic to be.

Those who have made the most careful study of the Speer work find that it is condemned because not understood. First, perhaps, because teachers do not take pains to get even a hint of the author's meaning, either as to his methods of presentation or their underlying principles. Second, they try to teach his work, basing it upon the number theory, which is as inconsistent as measuring allopathic medicines on a homeopathic plan. To furnish an adequate idea of the comparative value of the two systems, number and magnitude, we must note that in acquisition of thought power four years of the old number work is equalled or surpassed by two years of Speer work, and that without the use of a figure. Does not this confirm the statement that we do not think by figures nor progress by means of parrot processes in abstraction?

During the first primary year the most successful work is obtained without the written symbols. Even two years in arithmetic may be most profitably spent with no other means of representing the new feelings aroused than by the medium of objects, oral expression, or drawing. By observing the free play of the child with his toys we constantly see him picturing what he feels or sees by selecting, classifying, separating or constructing in equality or quantity.

The amount that can be done in this line of work cannot wholly be determined by age nor grade. The rapidity with which the child establishes truth relations can be the only guide for determining the amount to be accomplished.

Before name or symbol of an idea is given, the mind must come in contact with realities. The desire to handle and observe objects will make knowing possible and pleasurable. Various experience and partial judgments will clamor for expression; not in written symbols at first, but thru doing, before there is a desire for even oral expression. As soon as the need of a term arises, give it. But if it is thrust upon the worker, its use not being needed, the attention is centered upon the term instead of the thought it is intended to convey.

We do not get rational thought product by attempting to induce the child to reason by the steps the adult uses. No amount of verbal persuasion or explained formulas will take the place of wholesome judgments arising involuntarily from actual perception however crudely they are expressed. Each mind has its own order of development conditioned upon the amount and quality of its experience. Tho the primary and secondary end is to produce skill in detecting ratios, it is ratios of the concrete, not ratios which some seem to think exist in the written equasion. When certain expressions are required or certain processes substituted for the natural trend of deduction the thought operation is killed.

With the beginner we do not expect exact thought on anything. Why require exact expression? At first no distinction between objects is noticed tho they are unlike. Then the mind is not ready to be directed to working on the degree of unlikeness, much less to be asked to express it. One of the most harmful mistakes of the anxious teacher is to try to induce the expression of truths not evident to the child's mind. Owing to lack of tact in discerning how and what the child thinks, is the cause of Mr. Speer's methods, in the hands of amateurs, producing vitiated results.

This author would have us observe that the child will not notice that members of a certain pile of apples before him are identically the same, as soon as he would perceive that another pile contained a very

large and a very small apple. Differences are seen before equality, vagueness before exactness. It is true the child does not see the exact relation between the larger and the smaller building block at first, since he can do this only thru having the idea of equality highly developed. Remember how slowly the mind discriminates in its early development. No logical step can be omitted. By letting the pupil have various exercises in handling, seeing and hefting objects of equality and of difference he unconsciously, but slowly, perceives existing dissimilarity; then later he will discriminate the property of equality.

In developing the early powers of comparison, we select objects from various fields of study. In primary work it is no longer necessary for artificial devices to caper to the educator's cry for correlation of subjects. Arithmetic has been the most obstinate of studies in resisting the teacher's efforts to bring it in unity with other school work. The new arithmetic has its basis in phenomena presented by the material with which other sciences deal.

The initial stages of all sciences of material things begin at the same place, requiring the same mental processes of thought. If the foundation of these studies are so closely related, why not use the same method to excite thought in the mathematical realm as in botanical fields? Would a a teacher of botany venture to ask a pupil to observe the individual flower before looking at the plant as a whole? to dissect before observing unity? or synthesize before analyzing?

If it is true that quality is observed first as a unity, then the same order will be followed in gaining perceptions of quantity. An object, collection of objects, mass, or various qualities are first seen as wholes. We perceive a house without going thru processes of determining the composition of the structure or of the parts and their number. Generalities precede details. The next step is to separate and combine what the mind detects as smaller unities. To be more practical, ask your own mind if the particular parts of a new object receive attention before the general form, size, color, etc., is observed. Individualizing is a later step. Hence the inconsistency of requiring so much counting when relationship is not the end, or combining what should not at first have been divided. To know ten as a relative term means something more than counting out ten objects, or making a ten by combining a two and an eight, two fives, five twos, six and four, or seven and three. It requires first a percept of a thing as a unit, then its relation to whatever sub-units or parts may be discovered. After the mind makes this mental separation the parts are again seen collectively as a unit. Before the Speer work was introduced, most all teachers overlooked these fundamental truths.

Any system of arithmetic is going against the natural workings of the mind that requires the child to build an unknown quantity from uniting a three and a four before the seven is perceived as a whole, or before the mind evinces the fact that it perceives the seven to be composed of a three and a four of like units, or knows three, four, or seven as a ratio. For example: such work, as Harper or Milne has offered the mind for food, is cankering in its nature. They begin by demanding of the child "how many?" This is absurd for various reasons. It requires definiteness and exactness which is not possible at this stage. The organs of speech may be trained to state that three oranges and three oranges make six oranges, or that the cost of three is half the cost of six, and no faculty save memory be developed thereby. Arithmetic is to develop the reason which is done by judgments determined from perceiving relationships of tangible things. Then we are wrong in trying to coerce the mind to express that which is not born of self activity. What development results from such problems as 3 plus 4, minus 1, divide by 6, minus 2, for beginners, or from the way some formulas are used as mechanical devices for obtaining results without reasoning?

The teacher may know why, in a certain problem, 9 is to 12 as 90 is to x, but he should not allow the pupil to use such formula unless such evidence is seen by the

pupil to be true from observation of materials having these ratios. What is self-evident to the mind of one person may not be to another. The child, before seeing the relation three halves, no more knows that one and one-half tons of coal will cost six dollars, when one ton costs four, than he knows the cause of earthquakes before attending to accompanying phenomena.

Memorizing rules or doing as teacher or text-book directs, without making original discovery of the whys, is stultification. Logical work can never be done unless the instructor looks to the anticedent of every step in reasoning before trying to direct further thought. To appreciate or realize a truth the mind arrives at conclusions based upon previous experience. Breadth of thought and fineness of distinction come primarily from vague concepts obtained by that analysis and synthesis peculiar to each particular ego.

Whatever direction, prompting, or assistance given the child is harmful if it does for him what he can (within reason) do for himself. Questions generally confuse by straining the mind to attend to words rather than relations. One of the greatest beauties of the Speer work is its precaution against over-directing investigation. Individuality must be fostered. Premature hints and explanation may lead the pupil to make an attempt at expression before the idea is matured. The teacher is too apt to desire the pupil to express her ideas rather than its own. By feeling a truth, it becomes a part of us. The ego is not increased by the current practices of suggesting or stating a truth and requiring pupils to verify the same. As it is impossible for two persons to appreciate the same degree of beauty in a poem, painting, or musical selection, one is not prepared to express what the other sees or hears.

That expression may be clear, idea must be clear; that idea may be clear the conditions exciting thought must, for beginners, be least complicated. If the objects of study have many qualities strongly noticeable the mind is at first confused and may

(*Continued in next issue.*)

SCIENTIFIC.

An Instrument of Music.

If we ask one who has not investigated the subject, what sound is, likely the answer will be: "It is anything that we can hear," but if the individual starts to think out the nature of it, likely he will decide that it is a wonderful thing. We have been used to sound from our infancy, and usually it seems so common that no investigation is needed to understand it; but when we study its nature, its production, and its action, we find it to be a broad subject and one that involves the principles of physics and extensive mathematics.

First, let us consider a very important kind of motion,—that kind which is called vibration. Vibration is a to and fro motion. If it is regular like the movement of a pendulum, it is harmonic motion. There are many examples of this. The movement of the riddle of a threshing machine, the motion of the knife of a mowing machine, and the action of the piston rod of a steam engine are beautiful examples of harmonic motion. The water of the ocean vibrates up and down as it is traversed by waves, and the molecules of a solid vibrate according to the degree of heat that it has; for the vibration of molecules is heat. Light is the vibration of the subtle ether that fills all space of which we have any knowledge.

If a board is struck with a hammer it receives an impulse and in turn it gives an impulse to the surrounding air. That air gives an impulse to the next and so on, so that the disturbance spreads from the board in the form of an expanding sphere with the board at its center. If the disturbance reaches an ear, a sound is heard, the loudness of which depends upon the energy with which the air wave beats upon the tympanum. We all know that the further we are away from a sounding body the fainter is the sound. This is because the energy of the sound is spread over a greater space.

It can easily be shown by geometry that the intensity and loudness decreases as the square of the distance increases, i. e., at twice the distance the loudness is one-fourth, and at three times the distance the loudness is one-ninth and so on.

If the board should be struck five or six times per second, it would produce just that many waves per second. The ear could distinguish the strokes and a noise would be the result. Now, if the board should receive about thirty strokes per second, the ear could no longer distinguish the separate strokes, but they would blend into a continuous sound. If the rapidity and energy of the strokes should be uniform, the result would be a musical sound though it might not be pleasing. This is the difference between noise and music. Noise is the result of a single disturbance or a number of them without order. A musical sound is the result of impulses of sufficient rapidity, uniform energy and regular occurrence.

FORM OF A SOUND WAVE.

Throw a stone into the middle of a pond of still water, and a series of expanding concentric circles will surround the spot where it sinks. Does the water move from the center to the banks? Watch a chip floating on the pond. It moves up and down as the waves pass on. It does not move with the wave; neither does the water. So when a musical sound is produced in the air, waves, somewhat like water waves, spread out in every direction. The waves pass on, but the particles of air only vibrate to and fro. A water wave spreads in the form of a circle, a sound wave spreads in the form of a sphere. The particles of a water wave move up and down, the particles of air move back and forth in a straight line from the source of the sound. The former is called transverse vibration; the latter longitudinal. Water waves move slowly, air waves travel about eleven hundred feet per second.

All sounding bodies are in vibration. If a marble is suspended by a string and allowed to touch a ringing bell, it will be thrown away with considerable force, showing that the bell is in rapid vibration. If a bell is rung in a vacuum, we hear no sound because sound cannot travel where there is nothing in which to travel. Then a sounding body is in vibration, and that vibration must be communicated to the ear through some medium which is itself put in vibration. Sound is not only the result of vibration, but it is vibration that will affect the sense of hearing.

PITCH.

As previously stated, about thirty vibrations per second produce a musical sound, but it is of a very low pitch. If the number is increased the pitch is raised. If the energy of the wave is increased the sound is louder. So we see that the pitch of sound depends entirely upon the rapidity of vibration, and loudness depends upon the energy of vibration. If the rapidity is increased to 264 vibrations per second we have a note corresponding to middle C on the organ or piano. D has 297 vibrations per second, E 330, F 352, G 396, A 440, B 495, and C an octave higher than middle C has 528, which is just twice as many as for middle C. For the octave the vibration frequency is always doubled.

How is this difference of rapidity produced? Examine a guitar. The bass strings are wrapped with wire to make them heavy. This makes them slow in vibration. The strings of higher pitch are small and drawn very tight. Several notes can be played on one string by placing the fingers on different frets. The further up the finger board we go the higher is the pitch. The effect is the same as shortening the string. It is found that with the same tension the shorter the string the more rapid is the vibration. So with the guitar, banjo, mandolin, and other instruments with frets, the twelfth fret divides the string into two equal parts and always gives a note an octave higher than that of the open string. The lowest tones of the piano are played on strings about a yard long and heavier than an inch rope. Going up the scale the strings become shorter, smaller, and tighter. The highest are about as large as broom wire and only a few inches long. The lyre, harp, and

dulcimer have a similar arrangement. These are called the stringed instruments.

In the organ the music is produced by a reed or thin tongue of metal which is made to vibrate by a current of air from the bellows. The larger reeds produce the lower tones, and the smaller reeds, which vibrate faster, produce the higher tones. The accordeon, harmonica, organette, and concertina are other examples of reed instruments.

Blow across the mouth of a large bottle, a sound of low pitch is produced. Blow across the mouth of a small bottle, a sound of high pitch is produced. The sound is produced by the vibration of the column of air contained in the bottle. The longer the column the slower is the vibration. This principle is employed in the fife, flute, cornet, acorina and trombone. Such are called wind instruments.

Stringed instruments, reed instruments, and wind instruments are the most important kinds, but there are some others. The drum and tambourine employ a vibrating membrane. The zylophone and metallophone employ vibrating plates. Even horse shoes, bowls and bells are sometimes tuned for musical novelties.

QUALITY OR TIMBRE.

We see that loudness depends upon the energy of vibration, and pitch depends upon the rapidity of vibration. but here are two instruments, a banjo and a guitar, which may produce notes of the same loudness and same pitch, but do not sound alike. The same strength of vibration and the same rapidity, but what a difference in the sound! What causes this difference? So far we have considered only the fundamental tones. A great many sounds may pass through the air at the same time, and a great many tones may be produced by one string at the same time. The string not only vibrates as a whole, but it vibrates in segments, producing overtones of more or less intensity. Thus a string whose fundamental is A, may produce A, an octave, above the fundamental, E, which is still higher, and many other overtones. These overtones are not as loud as the fundamental, and we do not hear them distinctly; but they are there and they are the cause of differences in the sound of different instruments. It is not the mere vibration of the string of a musical instrument that makes the music. The string vibrates and causes the parts of the instrument to vibrate with it. These parts vibrate in sections, giving rise to many overtones which give to the music its quality or timbre. Now, as the parts of one instrument do not vibrate in exactly the same way as those of another, there is difference in the sound. It is for this reason that a violin does not sound like a guitar. The ear is a delicate organ and detects these differences, tho it does not reveal the cause of them. The ear appreciates certain combinations of these overtones. When they are produced in harmonious combinations, we say the instrument has a good sound. Thus we appreciate the four parts of choir music.

The overtones of an instrument are due mainly to the vibrating parts and not so much to the strings. Then in order to have the best music we must have such a sound box as will give the most pleasing combination of overtones. Do we have it? We have music which is beautiful and inspiring beyond description, but it is not the best. The vibration of the strings of the violin is hindered more or less by the fingers; the guitar, mandolin, and banjo require the use of both hands for a single note; the organ's tones are too monotonous; and the sounding board of the piano has too many strings fastened to it which hinder its vibration.

We seem to be contented with what we have, and because it is good we think it is the best. So did the sailors once think the sail-boat was the best, but by hard toil Robert Fulton showed the mistake. When will we have a better instrument? It will be when some one toils at it as Elias Howe did at the sewing machine, or as Dr. Morse did to furnish to the world the indispensable telegraph. Let some one make the effort, and produce an instrument of music that is better than the piano, as the reaper is better than the sickle.

N. BALDWIN.

WHITE AND BLUE.

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Pres. Board Direc's....MALCOLM LITTLE

The year hand of THE WHITE AND BLUE has made its third revolution. To-day, it commences the fourth as Vol. IV, No. 1. The whims of the new management are found on every page. If the contents please you come and tell us, if they don't go to the (printer's) devil.

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THE WHITE AND BLUE staff enter upon the stage of journalism, the gong sounds, up rolls the curtain. Readers, be merciful and don't use your opera glasses.

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As THE WHITE AND BLUE is published and owned by the students, naturally we will look to them for guidance. Their desire shall be our pleasure, their stand shall be our stand, and their battles our battles.

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The halls resound to the tread of the same number of feet this year as before, and all unconscious of any change, the great heart of the academy beats on. It is the same, yet different. Faces that lately formed the academy pictures are now in the practical field of experience; classmates who have worked side by side are separated. Think not, however, that you are forgotten. To-day we send greeting.

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Organization is essential to the life of a class. It is unite or die. Generally this truth is not realized until the third year when the enrollment has fallen off from two hundred to perhaps forty students. Then heroic measures are taken, but it is too late. The strength of youth has departed. Learn early the lessons of life, you high school classes

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The individual for his own good should be identified with a class. That too, not as an indifferent member, but as an active worker. As well be a man without a country as a man without a class.

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Academy athletics are and always were in a deplorable condition. Such a state of affairs should be remedied. The athletic association has stood long enough for something that is nothing. One thing, and only one, will relieve the present embarassment—money, with which to build a gymnasium. Then from some source filthy lucre must come.

Students, patrons, let not the light of another year witness this our weakness. THE WHITE AND BLUE suggests a vigorous, perhaps audacious step. It is this: Let the students in mass meeting assembled assume a debt of $2,000. Any man of means, who has felt the burning patriotism of the students, will take their honest word as quickly as he would take the securities of other men. With that sum at the head of a

subscription list start a committee out among the monied men of this and other cities. Such earnestness on the part of the students will have its effect. Men will rise to the occasion and subscribe liberally.

We fancy some of our WHITE AND BLUE readers growing pale at the mere thought of assuming such a responsibility. But remember, nothing ventured, nothing gained.

This proposition, however, does not seem so gigantic after a little reflection. The same number of students as were in attendance last year could, by paying $2 each, raise the much needed amount. By extending the payment over several years no hardship will be worked and the saying, "Many hands make light work" will be realized.

The very audacity of the act will prove its success. To you who are faint-hearted we say, muster up courage because the scheme is going through.

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Baseball.

The professional baseball game between the 1903's and 1902's was pulled off under favorable conditions. The line-up consisted of the brainy men of the collegiate department, many of whom, judging from their exquisite playing, had never before figured on a diamond. Webb, who is taking geometry, and therefore ought to know that the shortest distance between two points is a straight line, loped in a circle when after a fly. Walt Cluff intercepted a burning ball at third to his sorrow; while Karl Hopkins several times deluded himself into believing his locked hands contained the sphere. There were three ways in which batters might hope to reach first base—viz: three strikes, four balls, or a dead ball. As the throwing was wicked, the last method was easiest but impracticable, since it might necessitate going home in a box. The audience apparently enjoyed themselves immensely all the way along, but howled and shed tears of joy when Librarian Cope made a home-run on three strikes.

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Founders Day Exercises.

President Brimhall announced to the crowd of students and visitors in college hall that the exercises would begin by the choir rendering that beautiful song, "The Bright Crimson Morning."

After the invocation by President Partridge and a short opening address by Dr. Brimhall, President Joseph F. Smith spoke of the financial condition of the academy. Although the school had passed through hard struggles, he thought the Lord had overruled them for the school's good. He felt thankful that Brigham Young had been inspired to found the church schools, which are doing a mighty work in Zion. The maintenance of them had severely taxed the church, but the results accomplished have been sufficient reward. He saw a brighter day coming—a day when the school would no longer be cramped financially. The students were advised with all their getting to get the spirit of the Lord and obey His priesthood, then they would succeed.

"If these were my last words on earth" he said in closing, "I would want to bear testimony that God lives, and that He has restored His priesthood to those who now act with authority in His name. President Young was led to found this school that the spiritual side of young men and young women might be educated in the things of God."

Prof. Stanley E. Partridge rendered two piano selections very artistically.

Dr. Karl G. Maeser was deeply affected by the scene before him. A panorama of academy history had been passing before him. One of the most important lessons that he had learned during those years was to seek the spirit of God in all his undertakings.

He related one incident of President Young visiting the school at the end of the eighth or ninth week, and requiring him to do something that appeared to upset all his plans. "I worried Friday night," he said, "all day Saturday and Sunday and did not sleep Sunday night. Monday morning, while at the organ—I used to lead the choir—I leaned my head on my hand and asked the Lord to show me these things. I had it in a minute. The spirit said to me, 'Why did you not ask me Friday. I would have given it to you then.'"

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Things were always made plain to him when he sought the Lord, but he had passed through many sad experiences by neglecting to seek his Father. The students were urged to learn early in life this valuable lesson and thus escape much tribulation.

Mrs. Maria Holt and G. S. Beckstead, representatives of two of the families who have founded laboratories in the academy, spoke a few minutes.

Professor E. S. Hinckley represented his father's family, who that day founded a laboratory of natural science. From the academy ought and would, he thought, come the greatest scientists of the twentieth century. The greatest men of the past have brought forward the theory of evolution, part of which is erroneous. It rests with someone studying in the light of the gospel to unravel the mysteries and set the world aright.

Apostle Reed Smoot in behalf of the board of trustees accepted the gift. He thanked the Hinckley family from the bottom of his heart that God had inspired them to take this action.

Francis Kirkham represented the students in a few well chosen words. He was followed by President John whose remarks were opportune.

President Brimhall, in his habitual spirit of thankfulness and humility, referred to the Magleby family, who had no representative present, and said that the teachers thanked God for His many blessings upon the school.

In the true spirit of the hymn the choir and audience sang, "We Thank Thee, O, God, For a Prophet."

Thus ended the celebration of the twenty-fifth anniversary of the founding of the Brigham Young Academy.

ATHLETICS.

An interesting feature of the day was the contest in athletics, wherein those taking the missionary course were pitted against the rest of the school. A large crowd was out to see the fun. The boys gave vent to their stored-up patriotism in trying to deafen each other with class yells; sometimes laying aside partisanship and all uniting with a big

Ru, rah, ru rah ra,
'Cademy, 'cademy, B. Y. A.
Zip, boom bah, ya ya ya,
'Cademy, 'cademy, rah rah rah.

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PEDAGOGICAL—(Continued.)

[Thru an oversight the pedagogical article ends on page 7 with the words "continued in next issue." Substitute in place of "next issue" page 14 and go on reading the article.]

not be able to attend to the mathematical value of quantities. The material selected for first study should, therefore, be simple and that which will naturally lead to comparison of magnitudes.

Tho flowers or animals may be used to develop the idea one, or equality, yet they are not easily compared when quantities are unlike. When exactness of ratio is desired lines may be most safely used since there is but one dimension to consider. At first the child will say that two solids of the same height are equal in size, tho the other dimensions are unequal. Rectangles of surfaces in drawings or cuttings will be quite easily compared, but are more complex than lines for definite measurement, altho much easier of comparison than rectangular solids or spheres. Almost from the first it will be found that all these mathematical forms may be used sparingly for variety.

Various sets of objects possessing like relations must be used to establish the idea of ratio that the mind may be freed from the concrete. Too rapid change will confuse the mind and produce only meagre glimmerings of relationship. The variety of the child's natural environment is pleasing and unharmful, but mental chaos would result if he were pressed to the recognition of some exact truth from each object of environment. On the other hand, because the mind does not grasp all there is to get from one set of objects, is no sufficient reason for withholding observation of others. Only by repeated observation and expression will it be possible to think magnitude without the objects always at hand that possess these relative quantities.

Upon entering the realm of exact com-

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parison the mind must be able to hold the compared wholes so clearly in consciousness that they will not be confused by the use of a standard measure as a third term. In determining the relative length of two blackboards it is not enough to state that one is five spaces and the other three, or that the one is two feet longer than the other. If counting or number obscures the relation of units to be compared, the operation will lack the desired thought. A common unit of measurement should not be permitted until the need of such device calls for the same. Otherwise the relation of the compared quantities will be obscured by thrusting in a foreign element before the terms can be held firmly in conscious certitude. The object of measuring a magnitude by another is to determine their relation. But when two objects are to be compared by first getting a common measure for both, there must be some previous mental development before the child can keep in view the fact that ultimately he desires the ratio of the two stated quantities and not their ratio to the measuring unit or the number of parts in each. It must be borne in mind that counting yard spaces on a string, beads on a numeral frame, or pages of a book is not thinking magnitude and therefore is no complete fundamental part of mathematics.

It is the judgment formed by determining the relation of wholes to other wholes, or of wholes to their parts, and vice versa, that produces reasoning power. The question, "How many ounces in a pound?" would be of more educational value if changed to, "What is the relation of a pound to an ounce?" The relation of one to sixteen is a higher thought product than the remembeing of a table which says sixteen ounces make one pound.

We cannot conceive relation unless the mind can represent the things that bear relation. Remember that a number or figure

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cannot be compared with objects or with other numbers or figures. Hence the inconsistency of the old system of arithmetic. After much practice in dealing with quantity relation by applying it to objects, the very small pupil readily determines the value of five days' work by knowing the cost of two; for by his representative powers he at once images a quantity five times as great as one-half of the two. Knowing this is the time ratio he infers cost ratio would be the same. How rational this operation is compared with the mechanical method of a few years ago.

By the Speer method the great "bug bear" of fractions is reduced to nothing more intricate than the work in integers. How can the idea two, as a relation, be obtained without the relation one-half? Tho we perceive three, first as a unit, we note its composition of three lesser equal parts and immediately recognize one of these parts as a third. After the mind separates a thirty or a three into smaller parts it cannot reconstruct the quantity without an implied consciousness of thirds; whether the name third is known or not the idea must exist. So which is harder to comprehend, the one-third of three or the one-third of one? In either case the one or the three is a unit, and the thought or relationship one-third is obtained thru the same process. Twelve, five, eleven-ninths, or one-third is only a relation, then why make artificial distinction between studying integers and fractions?

By means of extensive practice in discovering relationships existing, the mind comes to know things in the only way knowable—by comparison. Since mathematics is now based upon tangible realities girls can, under the new system, keep pace with boys. Owing to girls' acuteness of perception, comparison will be pleasurable and easy. They have hitherto fallen behind in the race, not because of deficiency in rea-

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soning power, but because wrong methods have asked them to deal with abstractions instead of realities; make equasions from number rather than relations of real quantities, thus reversing the order of natural development. Boys have greater physical endurance, and therefore have taken time to impress the memory with the facts that reason should have known. Thus by mechanical methods they have long held undisputed supremacy in mathematics. But under judicious use of the Speer system they will not long enjoy this distinction unrivalled.

LAURA HICKMAN.

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It is plainly apparent that the students at the academy come from the country, where there is plenty of room and therefore no need of turning to the right. Someone not observing this unwritten law of society, when entering or passing out of college hall will get knocked into the middle of next week.

LOCALS.

THE WHITE AND BLUE is late, way late, in fact it is the latest thing out.

Locals dropped in the local box will receive confidential consideration.

Karl Hopkins has been elected to lead the 1903's through the present scoool year.

It has taken a long time to work upsteam, but now we are going full blast. You may expect another issue within a few days.

Because a man's legs are two and a half feet longer than is necessary to reach from his body to the ground, is no sign that he is a first-class singer.

Allen is making hot work out of the business management of THE WHITE AND BLUE. Printers, merchants, railroad men and all are getting a taste of his persistency, and the paper is experiencing benificent effects of his labors.

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The classes on Founder's Day behaved like little lambs. There wasn't a sign of a "scrap."

In the track sports Rollins and Smart were the star men, while Sanderson on the pole vault seemed to overcome the law of gravity. The game on the diamond was fiercely contested and ended 6 to 4 in favor of the school.

By inference we reach the conclusion that the domestic science department and that of needle work have amalgamated. Monday morning last the tables of the sewing room were decorated with onions. Is a famine pending among the girls?

Fragments are occasionally wafted White and Blueward from the faculty meetings. It seems that the most amusing feature to the teachers each Monday evening is the reading of petitions. Some of the high school students, finding their "coarses" considerably "two" hard "feel like petitioning your honorable body to ask you to drop a study." As a result of such arthographical and grammatical originality petitions are sometimes "referred back"

Ours (1903) is a manly class. We have about three gentlemen members to each lady.

The 1902 class has placed $40 worth of historical information in its library this semester.

The class of 1906 is fully organized. All that it needs is a beautiful banner to correspond with the members.

The organization of the class of 1905 has been perfected with the following officers: President, F. B. Hammond; vice-president, Marie Snow; secretary, Lambert Pack; treasurer, Florence Snyder.

In THE WHITE AND BLUE mass meeting Francis K. grew effusive in his expressions. In rythmic keeping with the movement of his hands, body, and eyes the following cadences floated away upon the contaminated air:

"True! Who ever heard of a 1902
That wasn't loyal to THE WHITE AND BLUE
I'll eat my hat, crown, rim and all
If 1902's not the loyalest of all.
Patriotism, why, we're full to the brim, and our dimes and our quarters are here to go into make this paper a roaring success. Whoop! Let her go!"

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The class of 1904 has obtained permission to establish a library of pedagogy.

In faculty—discussing the matter of having the domestic department, most of the members of which are novices, furnish luncheon for the board on Founder's Day—Prof. Lund opportunely remarked, "Prof. Brimhall, here's application of the words of the sage, "A little learning is a dangerous thing." Miss Reynolds, (not hearing distinctly,) "Prof. Lund, the Saviour didn't say that. It was Pope."

In some unexplained way 1903 last year came into possession of four dozen tin spoons. The law immediately went forth that the member first securing a pardner for life would be the recipient of the same. Don B. Colton immediately began "spooning" for the spoons. Friday evening the class went to the home of Mr. and Mrs. Colton, where class president Karl Hopkins in a happy vein commenced the presentation speech. About the middle of the ceremony those in attendance saw their president put his hands into his swallow-tailed coat pockets and then turn pale—the spoons had been forgotten. Then the band played.

A sharp paper:—A little boy cut himself severely while reading the Beaver Blade.

At the 1092 ball on the evening of Founders' Day about $65 was cleared. The money will be used in buying more books.

Some of the gentlemen of the 1902 class deem themselves guardians of their fairer sex and have advised them not to go out with those "young start-ups." Until further explanation is received we will suppose ourselves young candy factories.

The new features of the parade on Founder's Day were certainly an improvement. Darton's brass band hastened the flagging feet and gave the procession a military appearance, further continued by the two mounted horsemen carrying the stars and stripes and white and blue respectively. On reaching the place where the old building stood, a hollow square was formed. Dr. Karl G. Maeser spoke feelingly of the time when the enrollment numbered twenty-nine students. Twenty-five years had made a marvelous change. The students listened fondly to these reminiscences, realizing that the day is fast approaching when some other will relate second-hand these same things.

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Every department has a large increase of students over this time last year.

The school was glad to see the president, vice president, secretary and members of 1901 present Monday morning—all united in the person of Layfayette Rees.

There is one student in school with a friend. At the beginning of the year one of the omipresent 1906's in his aimless wandering of inspection, entered themuseum. Prof. Hinckley had a rattler in a fruit bottle (put up fresh) that he had been watching long and earnestly to see to what freak of ingenuity it would resort in order to crawl out of its skin when it could not crawl. Well, this sage brush devotee, beholding the companion of his chipmonk excursions, and feeling an impulse of native sympathy, hit on a means of extending the sphere of action of the unhappy snake. As a result the serpent became the tenant of a bird cage, "and now," as Prof. H. says, whenever the door of room A opens, the snake rises high on its coils with the light of a snakey longing, beaming from its eyes, anxiously peers at the comer to catch a glimpse of the familiar countenance of its benefactor.

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